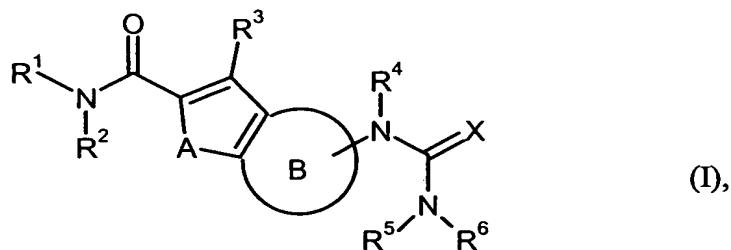


Claims

1. A compound of the formula



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in which

$R^1$  is 1-azabicyclo[2.2.2]oct-3-yl,

10  $R^2$  is hydrogen or  $C_1$ - $C_6$ -alkyl,

$R^3$  is hydrogen, halogen, amino, hydroxy or  $C_1$ - $C_6$ -alkyl,

15  $R^4$  is hydrogen,  $C_1$ - $C_6$ -alkyl which is optionally substituted by a radical selected from the group of hydroxy, halogen, cyano,  $C_1$ - $C_6$ -alkoxy, trifluoromethyl, trifluoromethoxy,

$R^5$  is hydrogen or  $C_1$ - $C_6$ -alkyl, or

20  $R^4$  and  $R^5$  together with the nitrogen atom to which they are bonded are a 5- to 6-membered heterocycle which is optionally substituted by up to 2 substituents independently of one another selected from the group of  $C_1$ - $C_6$ -alkyl,  $C_1$ - $C_4$ -acyl, oxo, thioxo,

25  $R^6$  is (i) hydrogen, (ii)  $C_1$ - $C_6$ -alkyl, (iii)  $C_3$ - $C_8$ -cycloalkyl, (iv)  $C_6$ - $C_{10}$ -aryl, (v) 5- to 10-membered heteroaryl, (vi)  $C_6$ - $C_{10}$ -arylcarbonyl, where (ii) is optionally substituted by phenyl,  $C_1$ - $C_6$ -alkoxycarbonyl

or  $C_1$ - $C_6$ -alkoxy, and (iv), (v) and (vi) are optionally substituted by up to 3 radicals selected independently of one another from the group of  $C_1$ - $C_6$ -alkyl,  $C_1$ - $C_6$ -hydroxyalkyl, 3- to 8-membered heterocycl,  $C_6$ - $C_{10}$ -aryl, 5- to 10-membered heteroaryl, hydroxy, halogen, cyano,  $C_1$ - $C_6$ -alkoxy,  $C_1$ - $C_6$ -acyl, trifluoromethyl, trifluoromethoxy, nitro, amino,  $C_1$ - $C_6$ -alkylamino,  $C_1$ - $C_6$ -acylamino, or

$R^5$  and  $R^6$  together with the nitrogen atom to which they are bonded are a 3- to 10-membered heterocycle which is optionally substituted by  $C_1$ - $C_6$ -alkyl or  $C_1$ - $C_6$ -hydroxyalkyl,

A is oxygen, nitrogen or sulfur,

X is oxygen or sulfur,

the ring B is benzo or pyrido, each of which are optionally substituted by radicals from the series halogen, cyano, trifluoromethyl, trifluoromethoxy, nitro, amino,  $C_1$ - $C_6$ -alkyl and  $C_1$ - $C_6$ -alkoxy,

and the solvates, salts or solvates of the salts of this compound.

2. A compound as claimed in claim 1, of the formula (I) in which

$R^1$  is 1-azabicyclo[2.2.2]oct-3-yl,

$R^2$  is hydrogen or  $C_1$ - $C_6$ -alkyl,

$R^3$  is hydrogen, halogen, amino, hydroxy or  $C_1$ - $C_6$ -alkyl,

R<sup>4</sup> is hydrogen, C<sub>1</sub>-C<sub>6</sub>-alkyl which is optionally substituted by a radical selected from the group of hydroxy, halogen, cyano, C<sub>1</sub>-C<sub>6</sub>-alkoxy, trifluoromethyl, trifluoromethoxy,

5 R<sup>5</sup> is hydrogen or C<sub>1</sub>-C<sub>6</sub>-alkyl, or

10 R<sup>4</sup> and R<sup>5</sup> together with the nitrogen atom to which they are bonded are a 5- to 6-membered heterocycle which is optionally substituted by up to 2 substituents independently of one another selected from the group of C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>1</sub>-C<sub>4</sub>-acyl, oxo, thioxo,

15 R<sup>6</sup> is (i) hydrogen, (ii) C<sub>1</sub>-C<sub>6</sub>-alkyl, (iii) C<sub>3</sub>-C<sub>8</sub>-cycloalkyl, (iv) C<sub>6</sub>-C<sub>10</sub>-aryl, (v) 5- to 10-membered heteroaryl, where (ii) is optionally substituted by phenyl, or C<sub>1</sub>-C<sub>6</sub>-alkoxy, and (iv) and (v) are optionally substituted by up to 3 radicals selected independently of one another from the group of C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>1</sub>-C<sub>6</sub>-hydroxyalkyl, 3- to 8-membered heterocycl, C<sub>6</sub>-C<sub>10</sub>-aryl, 5- to 10-membered heteroaryl, hydroxy, halogen, cyano, C<sub>1</sub>-C<sub>6</sub>-alkoxy, C<sub>1</sub>-C<sub>6</sub>-acyl, trifluoromethyl, trifluoromethoxy, nitro, amino, C<sub>1</sub>-C<sub>6</sub>-alkylamino, C<sub>1</sub>-C<sub>6</sub>-acylamino, or

25 R<sup>5</sup> and R<sup>6</sup> together with the nitrogen atom to which they are bonded are a 3- to 8-membered heterocycle which is optionally substituted by C<sub>1</sub>-C<sub>6</sub>-alkyl or C<sub>1</sub>-C<sub>6</sub>-hydroxyalkyl,

A is oxygen, nitrogen or sulfur, and

X is oxygen or sulfur, and

the ring B is benzo or pyrido, each of which are optionally substituted by radicals from the series halogen, cyano, trifluoromethyl, trifluoromethoxy, nitro, amino, C<sub>1</sub>-C<sub>6</sub>-alkyl and C<sub>1</sub>-C<sub>6</sub>-alkoxy,

5 and the solvates, salts or solvates of the salts of this compound.

3. A compound as claimed in either of claims 1 and 2, of the formula (I) in which

10 R<sup>1</sup> is 1-aza-bicyclo[2.2.2]oct-3-yl,

R<sup>2</sup> is hydrogen or C<sub>1</sub>-C<sub>4</sub>-alkyl,

15 R<sup>3</sup> is hydrogen, halogen, amino, hydroxy or C<sub>1</sub>-C<sub>4</sub>-alkyl,

R<sup>4</sup> is hydrogen, C<sub>1</sub>-C<sub>4</sub>-alkyl which is optionally substituted by a radical selected from the group of hydroxy, halogen, cyano, C<sub>1</sub>-C<sub>3</sub>-alkoxy, trifluoromethyl, trifluoromethoxy,

20 R<sup>5</sup> is hydrogen or C<sub>1</sub>-C<sub>4</sub>-alkyl, or

R<sup>4</sup> and R<sup>5</sup> together with the nitrogen atom to which they are bonded are a 5- to 6-membered heterocycle which is optionally substituted by up to 2 substituents independently of one another selected from the group of C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>1</sub>-C<sub>4</sub>-acyl, oxo, thioxo,

25 R<sup>6</sup> is (i) hydrogen, (ii) C<sub>1</sub>-C<sub>4</sub>-alkyl, (iii) C<sub>5</sub>-C<sub>6</sub>-cycloalkyl, (iv) phenyl, (v) 5- to 6-membered heteroaryl, (vi) C<sub>6</sub>-C<sub>10</sub>-arylcarbonyl, where (ii) is optionally substituted by phenyl, C<sub>1</sub>-C<sub>4</sub>-alkoxycarbonyl or C<sub>1</sub>-C<sub>3</sub>-alkoxy, and (iv), (v) and (vi) are optionally substituted by up to 3 radicals selected independently of one another from the group of C<sub>1</sub>-

$C_4$ -alkyl,  $C_1$ - $C_4$ -hydroxyalkyl, 3- to 8-membered heterocyclyl,  $C_6$ - $C_{10}$ -aryl, 5- to 10-membered heteroaryl, hydroxy, fluorine, chlorine, cyano,  $C_1$ - $C_3$ -alkoxy,  $C_1$ - $C_3$ -acyl, trifluoromethyl, trifluoromethoxy, nitro, amino,  $C_1$ - $C_3$ -alkylamino,  $C_1$ - $C_3$ -acylamino, or

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$R^5$  and  $R^6$  together with the nitrogen atom to which they are bonded are a 3- to 10-membered heterocycle which is optionally substituted by  $C_1$ - $C_3$ -alkyl or  $C_1$ - $C_3$ -hydroxyalkyl,

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A is oxygen or sulfur,

X is oxygen,

15

the ring B is benzo or pyrido, each of which are optionally substituted by radicals from the series chlorine, fluorine, cyano, trifluoromethyl, trifluoromethoxy, amino,  $C_1$ - $C_4$ -alkyl and  $C_1$ - $C_4$ -alkoxy,

and the solvates, salts or solvates of the salts of this compound.

20

4. A compound as claimed in any of claims 1 to 3, of the formula (I) in which

$R^1$  is 1-azabicyclo[2.2.2]oct-3-yl,

$R^2$  is hydrogen or  $C_1$ - $C_4$ -alkyl,

25

$R^3$  is hydrogen, halogen, amino, hydroxy or  $C_1$ - $C_4$ -alkyl,

$R^4$  is hydrogen or  $C_1$ - $C_4$ -alkyl which is optionally substituted by a radical selected from the group of hydroxy,  $C_1$ - $C_3$ -alkoxy, trifluoromethyl, trifluoromethoxy,

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R<sup>5</sup> is hydrogen or C<sub>1</sub>-C<sub>4</sub>-alkyl, or

5 R<sup>4</sup> and R<sup>5</sup> together with the nitrogen atom to which they are bonded are a 5- to 6-membered heterocycle which is optionally substituted by up to 2 substituents independently of one another selected from the group of C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>1</sub>-C<sub>4</sub>-acyl, oxo, thioxo,

10 R<sup>6</sup> is (i) hydrogen, (ii) C<sub>1</sub>-C<sub>4</sub>-alkyl, (iii) C<sub>5</sub>-C<sub>6</sub>-cycloalkyl, (iv) phenyl, (v) 5- to 6-membered heteroaryl, where (ii) is optionally substituted by phenyl, and (iv) and (v) are optionally substituted by up to 3 radicals selected independently of one another from the group of C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>1</sub>-C<sub>4</sub>-hydroxyalkyl, hydroxy, chlorine, fluorine, cyano, C<sub>1</sub>-C<sub>3</sub>-alkoxy, C<sub>1</sub>-C<sub>6</sub>-acyl, trifluoromethyl, trifluoromethoxy, amino, C<sub>1</sub>-C<sub>3</sub>-alkylamino, C<sub>1</sub>-C<sub>3</sub>-acylamino, or

15 R<sup>5</sup> and R<sup>6</sup> together with the nitrogen atom to which they are bonded are a 5- to 6-membered heterocycle which is optionally substituted by C<sub>1</sub>-C<sub>3</sub>-alkyl or C<sub>1</sub>-C<sub>3</sub>-hydroxyalkyl,

20 A is oxygen, nitrogen or sulfur,

X is oxygen and

25 the ring B is benzo or pyrido, each of which are optionally substituted by radicals from the series chlorine, fluorine, cyano, trifluoromethyl, trifluoromethoxy, amino, C<sub>1</sub>-C<sub>4</sub>-alkyl and C<sub>1</sub>-C<sub>4</sub>-alkoxy,

and the solvates, salts or solvates of the salts of this compound.

30 5. A compound as claimed in any of claims 1 to 4, of the formula (I) in which

1 R<sup>1</sup> is 1-azabicyclo[2.2.2]oct-3-yl,

2 R<sup>2</sup> to R<sup>4</sup> are hydrogen,

3 R<sup>5</sup> is hydrogen or C<sub>1</sub>-C<sub>4</sub>-alkyl, or

4 R<sup>4</sup> and R<sup>5</sup> together with the nitrogen atom to which they are bonded are a 5- to 6-membered heterocycle which is optionally substituted by up to 2 substituents independently of one another selected from the group of C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>1</sub>-C<sub>4</sub>-acyl, oxo, thioxo,

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R<sup>6</sup> is (i) hydrogen, (ii) C<sub>1</sub>-C<sub>4</sub>-alkyl, (iii) C<sub>5</sub>-C<sub>6</sub>-cycloalkyl, (iv) phenyl, (v) pyridyl, (vi) C<sub>6</sub>-C<sub>10</sub>-arylcarbonyl, where (ii) is optionally substituted by phenyl, C<sub>1</sub>-C<sub>4</sub>-alkoxycarbonyl or C<sub>1</sub>-C<sub>3</sub>-alkoxy, and (iv), (v) and (vi) are optionally substituted by up to 3 radicals selected independently of one another from the group of C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>1</sub>-C<sub>4</sub>-hydroxyalkyl, 3- to 8-membered heterocycl, C<sub>6</sub>-C<sub>10</sub>-aryl, 5- to 10-membered heteroaryl, hydroxy, fluorine, chlorine, cyano, C<sub>1</sub>-C<sub>3</sub>-alkoxy, C<sub>1</sub>-C<sub>3</sub>-acyl, trifluoromethyl, trifluoromethoxy, nitro, amino, C<sub>1</sub>-C<sub>3</sub>-alkylamino, C<sub>1</sub>-C<sub>3</sub>-acylamino, or

25 R<sup>5</sup> and R<sup>6</sup> together with the nitrogen atom to which they are bonded are a 3- to 10-membered heterocycle which is optionally substituted by C<sub>1</sub>-C<sub>3</sub>-alkyl or C<sub>1</sub>-C<sub>3</sub>-hydroxyalkyl,

30

A is oxygen or sulfur,

X is oxygen,

the ring B is benzo,

and the solvates, salts or solvates of the salts of this compound.

6. A compound as claimed in any of claims 1 to 5, of the formula (I) in which

5            R<sup>1</sup>      is 1-azabicyclo[2.2.2]oct-3-yl,

          R<sup>2</sup>      is hydrogen,

10           R<sup>3</sup>      is hydrogen, chlorine, fluorine, amino or C<sub>1</sub>-C<sub>3</sub>-alkyl,

15           R<sup>4</sup>      is hydrogen, methyl or ethyl, where methyl and ethyl are optionally substituted by a radical selected from the group of hydroxy, methoxy, ethoxy, trifluoromethyl, trifluoromethoxy, or

20           R<sup>4</sup> and R<sup>5</sup> together with the nitrogen atom to which they are bonded are a 5- to 6-membered heterocycle which is optionally substituted by up to 2 substituents independently of one another selected from the group of C<sub>1</sub>-C<sub>3</sub>-alkyl, C<sub>1</sub>-C<sub>4</sub>-acyl, oxo, thioxo,

25           R<sup>5</sup>      is hydrogen or C<sub>1</sub>-C<sub>3</sub>-alkyl,

          R<sup>6</sup>      is (i) hydrogen, (ii) C<sub>1</sub>-C<sub>4</sub>-alkyl, (iii) cyclopentyl, cyclohexyl, (iv) phenyl, (v) benzyl, (vi) phenethyl, where (iv) to (vi) are optionally substituted by up to 3 radicals selected independently of one another from the group of hydroxy, chlorine, fluorine, cyano, methoxy, ethoxy, C<sub>1</sub>-C<sub>4</sub>-acyl, trifluoromethyl, trifluoromethoxy, amino, C<sub>1</sub>-C<sub>3</sub>-alkylamino,

30           A      is oxygen or sulfur,

          X      is oxygen and

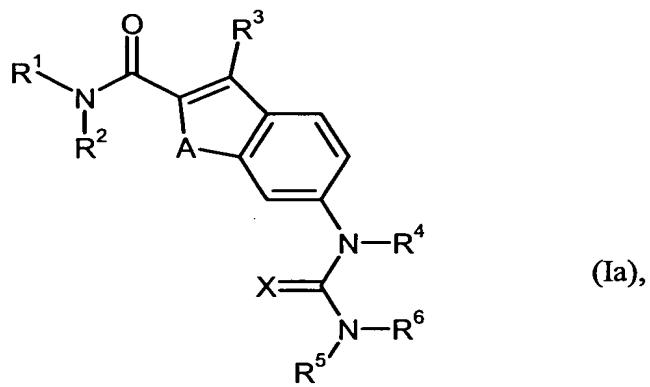
the ring B is benzo which is optionally substituted by radicals from the series chlorine, fluorine, cyano, trifluoromethyl, trifluoromethoxy, C<sub>1</sub>-C<sub>4</sub>-alkyl, methoxy and ethoxy,

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and the solvates, salts or solvates of the salts of this compound.

7. A compound of the formula

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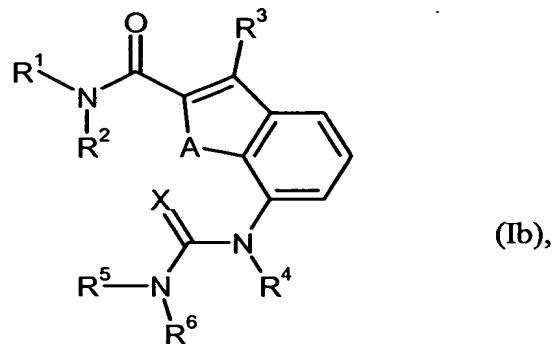


in which

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R<sup>1</sup> to R<sup>6</sup>, A and X have the meanings indicated in claims 1 to 6, and the solvates, salts or solvates of the salts of this compound.

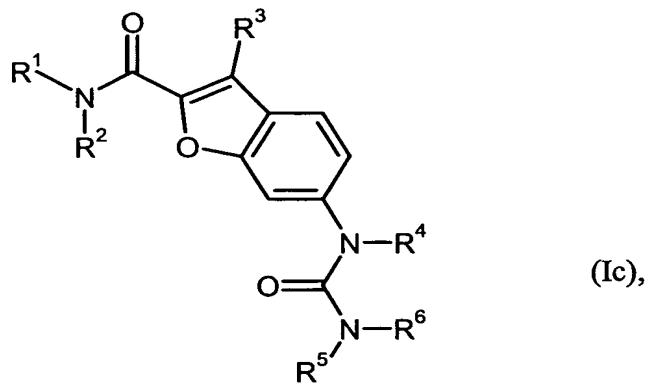
8. A compound of the formula



in which

5  $R^1$  to  $R^6$ , A and X have the meanings indicated in claims 1 to 6, and the  
solvates, salts or solvates of the salts of this compound.

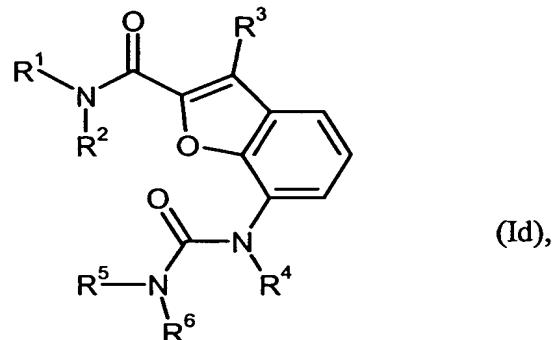
9. A compound of the formula



10 in which

$R^1$  to  $R^6$  have the meanings indicated in claims 1 to 6, and the solvates, salts  
or solvates of the salts of this compound.

10. A compound of the formula

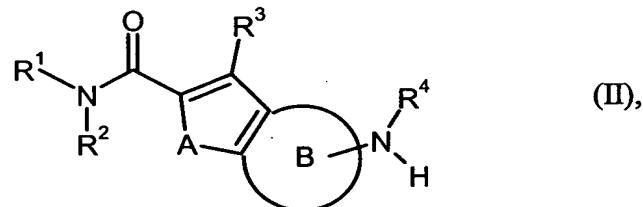


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in which

$R^1$  to  $R^6$  have the meanings indicated in claims 1 to 6, and the solvates, salts or solvates of the salts of this compound.

10 11. A process for preparing compounds as claimed in claims 1 to 10, in which compounds of the formula



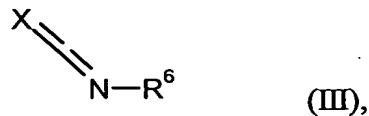
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in which

$R^1$  to  $R^4$ , A and B have the meanings mentioned in claims 1 to 10,

are reacted with compounds of the formula

20



in which

5        X and R<sup>6</sup> have the meanings mentioned in claims 1 to 5,

and the resulting compounds (I) are reacted where appropriate with the appropriate (a) solvents and/or (b) bases or acids to give the solvates, salts or solvates of the salts thereof.

10

12. A compound as claimed in any of claims 1 to 10 for the treatment and/or prophylaxis of diseases.

15        13. A medicament comprising at least one compound as claimed in any of claims 1 to 10 and at least one pharmaceutically acceptable, essentially nontoxic carrier or excipient.

20        14. The use of compounds as claimed in any of claims 1 to 10 for producing a composition for improving perception, concentration, learning and/or memory.

25        15. The use of compounds as claimed in any of claims 1 to 10 for producing a medicament for the treatment and/or prophylaxis of impairments of perception, concentration, learning and/or memory.

16. A medicament as claimed in claim 13 for the treatment and/or prophylaxis of impairments of perception, concentration, learning and/or memory.

17. A method for control in impairments of perception, concentration, learning and/or memory human or animal by administration of an effective amount of the compounds from claims 1 to 10.